Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Jiminy Peak Resorts, Inc.

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
December 19, 2003

Table 1: Public Water System (PWS) Information

PWS Name	Jiminy Peak Resorts, Inc.
PWS Address	37 Corey Road
City/Town	Hancock, Massachusetts
PWS ID Number	1121004
Local Contact	Mr. John Sullivan
Phone Number	(413) 238-5344

Sources: Zone II GIS ID #358

Well Name	***Source ID#***	***Zone I (in feet)***	***Source Susceptibility***
Tubular Wellfield	1121004-06G	250	Moderate

Well Name	***Source ID#***	***Zone I (in feet)***	***IWPA***	***Source Susceptibility***
Well #1	1121004-01G	300	880	High
Well #2	1121004-02G	325	1,104	High
Well #3	1121004-03G	274	521	Moderate
Well #4	1121004-04G	240	720	Moderate
Well #5	1121004-05G	235	576	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water sources may be threatened by many potential sources of contamination, including septic systems, road salting, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The Zone II** The primary recharge area defined by a hydrogeologic study.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

1. Description of the Water System

Jiminy Peak is the largest ski resort in Massachusetts and is located on Potter Mountain. The ski area has operated since 1948 and the facilities have expanded into Jiminy Peak Resorts, Inc., a year-round recreational resort and residential condominium complex in Hancock, Massachusetts. Hancock is a small rural residential community situated between the Berkshire Hills and the Taconic Range on the New York border in Berkshire County. The community includes a full service ski area, seven condominium associations with over 360 units, laundry facilities, restaurants, swimming pools and a health club. The Town of Hancock does not have municipal water or sewer; therefore, Jiminy Peak's Utility Department operates a public water system and a wastewater treatment facility. The system has a groundwater discharge permit for wastewater disposal. Jiminy Peak Resorts, Inc. maintains all of the facilities at the ski area and resort, including the lifts and all of the grooming and maintenance equipment. The facility is registered as a very small quantity generator of hazardous waste and operates a waste oil burner to dispose of the limited amount of waste oil generated.

Jiminy Peak maintains and operates six groundwater supply sources. Wells #1 through #5 are 6-inch diameter wells drilled into bedrock, while Well #6 is a tubular wellfield consisting of 4-2.5-inch diameter wells drilled in a sand and gravel aquifer. The depths and approved withdrawal rates for Wells #1 through #5 are as follows: Well #1 is 300 feet deep with an approved rate of 15 gpm; Well #2 is 245 feet deep with an approved rate of 23 gpm; Well #3 is 150 feet deep with an approved rate of 10 gpm; Well #4 is 440 feet deep with an approved rate of 4 gpm; and Well #5 is 500 feet deep with an approved rate of 5.5 gpm. The wellfield 06G, consists of 4-2.5-inch diameter wells, drilled to 56 feet with a total approved withdrawal rate of 60 gpm.

The Zone I is the protective area immediately surrounding the source and is assumed to contribute recharge to the source. The Zone I for individual wells is a circle centered on the well with a radius ranging from 100 to 400 feet based on the approved withdrawal rate from the well. A wellfield is a series of wells located proximal to each other that are pumped simultaneously. The Zone I for a wellfield is an area defined by a 250 feet radial distance from the outside edges of the wellfield. The Zone I for source 06G terminates downgradient along the Kinderhook Creek and Bentley Brook. The Zone II is the scientifically determined primary recharge area for the source. The Zone II, contribution area for the wellfield 06G, was delineated utilizing empirical data from an extended duration pumping well and an analytical model. An IWPA is a primary

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
Non-conforming Zone I	-	-	-	Wells #1 and #2 – Contact DEP prior to conducting any work in Zone I or expanding the system.
Underground Storage tanks	No	02G	High	Leaks, spills, or improper handling.
Above Ground Storage tanks	No	01G	Moderate	Leaks, spills, or improper handling.
Maintenance garage (hazardous materials)	No	01G	High	Floor drains are connected to a tight tank.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA/ Zone II	Threat	Comments
High density residential	01G & 02G	01G – 04G	Moderate	Potential threats are from nitrates, erosion and microbial contaminants.
Transportation corridors/parking	02G	All	Low/ Moderate	Erosion, stormwater: leaks, spills, or improper handling; road building.
Groundwater discharge	No	02G	Moderate	Potential threats are from nitrates and microbial contaminants.
Storage	06G	06G	Low/ Moderate	Periodically materials are stored within the Zone I and Zone II. Monitor activities and prohibit storage in Zone I.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

recharge area designated for a groundwater source when the Zone II has not yet been delineated. The actual recharge area for a well may be significantly larger or smaller than the IWPA.

The wells #1 through #5 are at various locations throughout the ski area and resort. Wells #1 and #2 are non-conforming with respect to Zone I restrictions. Well #1 is located on a slope with a chairlift and two lift lines in the Zone I. Well #2 is located in front of one of the condominium units. The IWPAs for wells #1 and #2 include most of the facilities at the resort; a lift and liftline are within the Zone I of Well #5. Wells #3, 4, and 6 have conforming Zone Is. The Zone II for well #6 includes the snowmaking pond that is lined with an impermeable liner.

Geologic mapping and field observations indicate thin overburden of till on the upland and relatively thin stratified drift (sand and gravel) deposits in the valleys. Well #6 is located within the stratified drift deposits of Kinderhook Creek. The stratified drift was deposited during the recession of the glaciers approximately 18,000 years ago. The bedrock is a complex series of folds and faults with rock mapped as phyllite and schist of the Taconic Allocthon. Wells #1 through #5 are drilled into the bedrock. There is no evidence of a confining unit at the locations of any of the wells. Wells located in these conditions are considered to have a high vulnerability to contamination due to the absence of hydrogeologic barriers that can prevent contaminant migration. Please refer to the attached map of the Zone I, IWPA and Zone II.

The DEP requires public water suppliers to monitor the quality of the water. For current information on monitoring results and treatment, please contact the Public Water System contact person listed above in Table 1 for a copy of the most recent Consumer Confidence Report. Drinking water monitoring reporting data is also available at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html, the website for EPA's Envirofacts.

2. Discussion of Land Uses in the Protection Areas

There are some land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

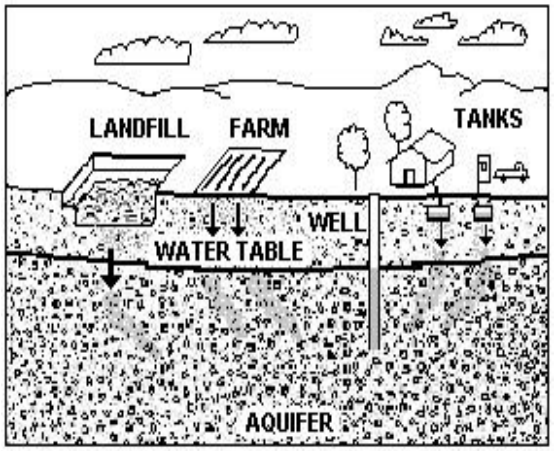

Figure 1: Example of how a well could become contaminated by different land uses and activities.

Key issues include:

1. **Non-conforming Zone I;**
2. **High Density Residential;**
3. **Hazardous materials handling (maintenance);**
4. **Wastewater treatment plant;**
5. **Underground/Above ground fuel storage; and**
6. **Transportation corridor/parking.**

The overall ranking of susceptibility to contamination for the system is high, based on the presence of at least one high threat land use or activity in the IWPA of the wells, as seen in Table 2. However, only wells 01 and 02G have high threat activities in the protection areas.

1. Non-conforming Zone I – Wells #1 and #2 have non-conforming Zone I with respect to activities within the Zone I. Ski trails and a lift line are located within the Zone I of Well #5. There is a ski lift and lines within the Zone I of Well #1 and condominiums in the Zone I of Well #2.

Recommendations:

✓ Although it is impossible to remove all activities within the non-conforming Zone Is, continue to work toward prohibiting/limiting activities in close proximity to the wells and using BMPs to protect the water supplies.

2. High Density Residential/Commercial Land Uses – The Zone I and/or IWPA for Wells #1 through #5 have high-density residential land use and other resort activities. If managed improperly, activities associated with residential and resort areas can contribute to drinking water contamination. Many of the newer facilities utilize propane for fuel. The older main lodge area has two fuel oil USTs. The maintenance facility has a new above ground storage tank. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) and their associated fuel lines can be potential sources of contamination due to leaks or spills of the fuel oil they store.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at http://www.state.ma.us/dep/brp/wm/nonpoint.htm.

Residential Land Use Recommendations:

V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and online at the MA DEP website - www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

V Continue the use and maintenance of BMPs for activities within close proximity to the wells.

V Do not use pesticides or fertilizers within the Zone I of the wells. Consider the use of Integrated Pest Management to minimize the use of pesticides and nutrients in fertilizers.

V Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Copies of this assessment have been made available to the public water supplier and town boards.

- Promote BMPs for stormwater management and pollution controls and continue monitoring and managing stormwater runoff, directing it away from the wells.

3. Hazardous Materials Storage and Use – The facility utilizes hazardous materials and generates hazardous waste. The new maintenance garage has floor drains that are followed by oil water separators and discharge to a tight tank. The Bureau of Waste Prevention regulates the management of hazardous waste. Spill kits and signs designating areas of storage were noted during the visit. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. It should be noted that vehicle washing is a restricted activity under the UIC regulations. Review requirements for vehicle washing as appropriate or contact the UIC staff (Tony Zaharias 413-755-2122 or Rick Larson 413-755-2207) regarding additional information about vehicle washing activities.

Hazardous Materials Storage and Use Recommendations:

- Continue current management of hazardous materials on site and consider relocation of the well to minimize any potential threat from an accidental release at the site.

4. Wastewater Treatment Plant – The Wastewater Treatment Plant discharges to the ground within the IWPA of Well #2. Activities associated with wastewater treatment involve storage and use of hazardous materials such as chlorine and other treatment chemicals. Municipal wastewater contains contaminants including bacteria, viruses, metals and volatile chemicals. Spills, leaks or mismanagement of wastewater, hazardous materials and stormwater at the plant are potential sources of contamination.

Wastewater Treatment Plant Recommendations:

- ✓ Ensure the wastewater treatment facility is operated and maintained according to DEP requirements.
- ✓ Work to have stormwater drains and the drainage system around the wastewater treatment plant mapped.
- ✓ Use best management practices for proper handling of materials and in containing spills and leaks.

5. Underground and Above Ground Storage Tanks (UST) – There are two USTs and one AST located at the facility within the IWPA of Well #1 and/or Well #2. The AST at the maintenance garage is new and the two USTs contain fuel oil.

Recommendations:

- USTs in close proximity to the water supply should be closely monitored for signs of leaking or failure and during deliveries. Review stormwater flow direction and anticipate control of a potential spill during delivery. Replace and upgrade tanks as appropriate.
- Continue to evaluate and consider a replacement well location and use of alternative fuel, as is feasible.
- Any upgrades and modification to fuel storage facilities must meet current construction standards and be done consistent with Massachusetts's plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- Require fuel lines to be sleeved to protect from leaks or have appropriate protection.
- Review construction details for the tanks to ensure that they include overfill protection. Retrofit those without containment, as is feasible.
- Ensure that a spill response plan is included in the emergency response plans and ensure spill containment equipment is available. Include plans of storm drain systems in the emergency response plan.

6. Transportation corridor and parking – The access and parking areas for the facilities are within Zone I of Well #2 and the IWPA of Wells #2 through #5. Accidents and normal use and maintenance of roads pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

Recommendations:

- Prepare an Emergency Response Plan that includes coordination between the emergency responders to be sure they area aware of the location of your well.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the sources' susceptibility to contamination. Jiminy Peak is commended for recent development of wells that are in compliance and is encouraged to use diligence in monitoring activities within and near protection areas. The water supplier should review and adopt the key recommendations above.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at: http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Source protection fact sheets